Paper 2: Appendix

The first derivative of portfolio skewness with respect to the asset weights $\boldsymbol{w_p}$ equals three times the coskewness vector $\boldsymbol{\Sigma_p}$, which is:

$$\frac{\partial s^3(R_p)}{\partial \boldsymbol{w_p}} = 3\boldsymbol{\Sigma_p}$$

Proof: The nth centered moment of the return of a portfolio is given by:

$$m^n(R_p) = E\{[R_p - E(R_p)]^n\} = E\left\{\left[\sum_{i=1}^{N} w_{pi}(R_i - E(R_i))\right]^n\right\}$$

The first partial derivative of the nth centered moment of the portfolio returns distribution with respect to w_{pi} , the ith entry of the (Nx1) vector w_p ,is given by:

$$\frac{\partial m^n(R_p)}{\partial w_{pi}} = nE\left\{\left[\sum_{i=1}^{N} w_{pi}(R_i - E(R_i))\right]^{n-1}\right\} E\{[R_i - E(R_i)]\}$$

$$= nE\left\{[R_p - E(R_p)]^{n-1}[R_i - E(R_i)]\right\} = nC_n(R_i, R_p)$$

$C_n(R_i, R_p)$ is the comoment of nth order between the return on asset i and the return on the market portfolio p with $i = [1, \ldots . N]$. Using vectorial notation, for $n = 3$, this yields:

$$\frac{\partial s^3(R_p)}{\partial \boldsymbol{w_p}} = \vdots \begin{pmatrix} \frac{\partial s^3(R_p)}{\partial w_{\boldsymbol{p1}}} \\ \vdots \\ \frac{\partial s^3(R_p)}{\partial w_{\boldsymbol{pN}}} \end{pmatrix} = \begin{pmatrix} 3E\left\{[R_p - E(R_p)]^2[R_1 - E(R_1)]\right\} \\ \vdots \\ 3E\left\{[R_p - E(R_p)]^2[R_N - E(R_N)]\right\} \end{pmatrix} = 3\boldsymbol{\Sigma_p}$$

$$\frac{\partial \sigma^2(R_p)}{\partial \boldsymbol{w_p}} = \vdots \begin{pmatrix} \frac{\partial \sigma^2(R_p)}{\partial w_{\boldsymbol{p1}}} \\ \vdots \\ \frac{\partial \sigma^2(R_p)}{\partial w_{\boldsymbol{pN}}} \end{pmatrix} = \begin{pmatrix} 2E\{[R_p - E(R_p)][R_1 - E(R_1)]\} \\ \vdots \\ 2E\{[R_p - E(R_p)][R_N - E(R_N)]\} \end{pmatrix} = 2\boldsymbol{\Omega w_p}$$

$\boldsymbol{p}$

Paper 2: Online Appendix

Table 1: Sample countries

Country	Datastream Research List			
Austria	Active:	FOST	Dead:	DEADOE
Belgium	Active:	FBEL	Dead:	DEADBG
Czech Republic	Active:	FCZECH	Dead:	DEADCZ
Denmark	Active:	FDEN	Dead:	DEADDK
Finland	Active:	FFIN	Dead:	DEADFN
France	Active:	FFRA	Dead:	DEADFR
Germany	Active:	FGER1/2	Dead:	DEADBD1/2/3
Greece	Active:	FGREE	Dead:	DEADGR
Ireland	Active:	FIRL	Dead:	DEADIR
Italy	Active:	FITA	Dead:	DEADIT
Netherlands	Active:	FHOL	Dead:	DEADNL
Norway	Active:	FNOR	Dead:	DEADNW
Portugal	Active:	FPOR	Dead:	DEADPT
Spain	Active:	FSPN	Dead:	DEADES
Sweden	Active:	FSWA	Dead:	DEADSW
United Kingdom	Active:	FBRIT	Dead:	DEADUK

Note: The table presents the Datastream mnemonics of the utilised Datastream research indices.

Table 2: Number of Real Estate Equities in 16 Portfolios Formed on Size and BE/ME

	Real Estate Equities																			
	S1	S2	S3	S4	S1 B1	S1 B2	S1 B3	S1 B4	S2 B1	S2 B2	S2 B3	S2 B4	S3 B1	S3 B2	S3 B3	S3 B4	S4 B1	S4 B2	S4 B3	S4 B4
06.88	12	11	11	12	4	2	3	3	3	2	3	3	3	2	3	3	4	2	3	3
06.89	19	18	18	19	5	4	5	5	5	4	4	5	5	4	4	5	5	4	5	5
06.90	20	20	19	21	6	4	5	5	6	4	5	5	5	4	5	5	6	4	5	6
06.91	20	20	19	21	6	4	5	5	6	4	5	5	5	4	5	5	6	4	5	6
06.92	20	19	18	20	6	4	5	5	5	4	5	5	5	4	4	5	6	4	5	5
06.93	21	21	20	22	6	4	5	6	6	4	5	6	6	4	5	5	6	5	5	6
06.94	23	22	21	23	6	5	6	6	6	5	5	6	6	4	5	6	6	5	6	6
06.95	21	21	20	22	6	4	5	6	6	4	5	6	6	4	5	5	6	5	5	6
06.96	23	23	22	24	6	5	6	6	6	5	6	6	6	5	5	6	7	5	6	6
06.97	28	28	27	29	8	6	7	7	8	6	7	7	7	6	7	7	8	6	7	8
06.98	29	29	28	29	8	6	7	8	8	6	7	8	8	6	7	7	8	6	7	8
06.99	28	27	26	28	8	6	7	7	7	6	7	7	7	6	6	7	8	6	7	7
06.00	32	32	31	33	9	7	8	8	9	7	8	8	8	7	8	8	9	7	8	9
06.01	29	29	28	30	8	6	7	8	8	6	7	8	8	6	7	7	8	7	7	8
06.02	30	30	29	30	8	7	7	8	8	7	7	8	8	6	7	8	8	7	7	8
06.03	30	29	29	30	8	7	7	8	8	6	7	8	8	6	7	8	8	7	7	8
06.04	27	27	26	27	7	6	7	7	7	6	7	7	7	6	6	7	7	6	7	7
06.05	27	26	25	27	7	6	7	7	7	6	6	7	7	5	6	7	7	6	7	7
06.06	34	34	33	34	9	8	8	9	9	8	8	9	9	7	8	9	9	8	8	9
06.07	37	36	36	37	10	8	9	10	10	8	9	9	10	8	9	9	10	8	9	10
06.08	32	31	30	32	9	7	8	8	8	7	8	8	8	7	7	8	9	7	8	8
Mean	26	25	25	26	7	6	6	7	7	5	6	7	7	5	6	7	7	6	6	7

Note: The table presents the number of real estate equities in 16 portfolios formed on size and BE/ME. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June of year t, all real estate equities are ranked on size, measured by market capitalization and sorted into four size portfolios according to the size quartiles. Subsequently, all real estate equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into four BE/ME portfolios according to the BE/ME quartiles. The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. The last row represents the average number of real estate equities in each portfolio from 1988 to 2008.

Table 3: Number of General Equities in Six Portfolios Formed on Size and BE/ME

	General Equities							
	S1	S2	S1 B1	S1 B2	S1 B3	S2 B1	S2 B2	S2 B3
06.88	1017	1016	306	405	306	305	406	305
06.89	1349	1349	405	539	405	405	539	405
06.90	1453	1453	436	581	436	436	581	436
06.91	1492	1492	448	596	448	448	596	448
06.92	1476	1475	443	590	443	443	589	443
06.93	1527	1527	459	609	459	459	609	459
06.94	1646	1645	494	658	494	494	657	494
06.95	1664	1664	500	664	500	500	664	500
06.96	1938	1937	582	774	582	582	773	582
06.97	2131	2131	640	851	640	640	851	640
06.98	2314	2313	695	924	695	694	925	694
06.99	2363	2363	709	945	709	709	945	709
06.00	2554	2554	767	1020	767	767	1020	767
06.01	2526	2526	758	1010	758	758	1010	758
06.02	2284	2283	686	912	686	685	913	685
06.03	2040	2039	613	815	612	612	815	612
06.04	2069	2069	621	827	621	621	827	621
06.05	2109	2109	633	843	633	633	843	633
06.06	2214	2214	665	884	665	665	884	665
06.07	2340	2339	703	935	702	702	935	702
06.08	2072	2072	622	828	622	622	828	622
Mean	1932	1932	580	772	580	580	772	580

Note: The table presents the number of general equities in six portfolios formed on size and BE/ME. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June year t, all general equities are ranked on size, measured by market capitalization and sorted into two size portfolios according to the size median. Subsequently, all general equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into three BE/ME portfolios (30-40-30). The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 and S2 represent the two size portfolios from smallest to largest. B1 to B3 represent the sub-division into three BE/ME portfolios from highest to lowest. The last row represents the average number of general equities in each portfolio from 1988 to 2008.

Table 4: Returns and Characteristics of 16 Real Estate Equity Portfolios Formed on Size and BE/ME

Real Estate Equities							
	Panel I: Returns						
	B1	B2	B3	B4	Mean	HML	t(HML)
S1	1.07%	0.93%	0.91%	-0.05%		1.11%	2.72
S2	1.07%	0.82%	0.60%	0.84%		0.23%	0.66
S3	0.80%	0.73%	0.36%	0.01%		0.79%	2.47
S4	0.89%	0.44%	0.56%	0.46%		0.44%	1.27
Mean						0.64%	2.75
SMB	0.17%	0.49%	0.35%	-0.50%	0.13%		
t(SMB)	0.49	1.35	1.02	-1.29	0.58		
Obs.	252	252	252	252			
	Panel II: Size						
	B1	B2	B3	B4		Mean	Break
S1	90.51	92.45	97.85	99.67		95.14	< 144.94
S2	229.44	232.49	236.10	226.94		231.07	< 297.15
S3	460.74	474.92	482.28	471.02		471.78	< 619.58
S4	2196.08	2035.57	1591.14	1508.57		1831.46	> 619.58
Mean	754.00	721.06	605.75	584.68		665.80	
Obs.	252	252	252	252			
	Panel III: BE/ME						
	B1	B2	B3	B4		Mean	Obs.
S1	1.59	1.11	0.87	0.50		1.02	252
S2	2.49	1.11	0.86	0.54		1.28	252
S3	1.97	1.09	0.88	0.54		1.13	252
S4	4.88	1.05	0.81	0.48		1.89	252
Mean	2.75	1.09	0.86	0.51		1.34	
Break	> 1.26	> 0.96	> 0.71	< 0.71			

Note: The table presents the returns and characteristics of 16 real estate equity portfolios formed on size and BE/ME. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June year t, all real estate equities are ranked on size, measured by market capitalization and sorted into four size portfolios according to the size quartiles. Subsequently, all real estate equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into four BE/ME portfolios according to the BE/ME quartiles. The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. The first panel presents the discrete, equally-weighted average monthly returns on all equities in the 16 real estate equity portfolios from July 1988 to June 2009. SMB represents the size effect and is calculated as the average monthly spread between the return on small and big stocks for a given BE/ME portfolio. HML represents the value effect and is calculated as the average monthly spread between the return on high and low BE/ME stocks for a given size portfolio. Mean SMB and HML represents the average size and value effect across all portfolios. The last two panels present the average size (in €m) and BE/ME of each portfolio at the time of portfolio formation from 1988 to 2008. The breaks indicate the level beyond which a company is sorted into the respective portfolio. Returns, as well as size and BE/ME, are denominated in Euros.

Table 5: Characteristics and Returns of Six General Equity Portfolios Formed on Size and BE/ME

General Equities						
	Panel I: Returns					
	B1	B2	B3	Mean	HML	t(HML)
S1	1.54%	0.76%	0.11%		1.43%	8.21
S2	1.11%	0.65%	0.31%		0.80%	4.67
Mean					1.11%	6.88
SMB	0.43%	0.11%	-0.20%	0.11%		
t(SMB)	3.30	0.93	-1.46	0.99		
Obs.	252	252	252			
	Panel II: Size					
	B1	B2	B3		Mean	Break
S1	32.31	41.46	43.63		39.36	< 111.61
S2	1674.57	2793.43	2683.82		2424.61	> 111.61
Mean	853.27	1417.44	1363.56		1231.87	
Obs.	252	252	252			
	Panel III: BE/ME					
	B1	B2	B3		Mean	Obs.
S1	5.55	0.68	0.26		2.01	252
S2	3.53	0.51	0.22		1.33	252
Mean	4.54	0.59	0.24		1.67	
Break	> 0.84	> 0.40	< 0.40			

Note: The table presents the returns and characteristics of six general equity portfolios formed on size and BE/ME. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June year t, all general equities are ranked on size, measured by market capitalization and sorted into two size portfolios according to the size median. Subsequently, all general equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into three BE/ME portfolios (30-40-30). The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 to S2 represent the two size portfolios from smallest to largest. B1 to B3 represent the sub-division into three BE/ME portfolios from highest to lowest. The first panel presents the discrete, equally-weighted average monthly returns on all equities in the 16 general equity portfolios from July 1988 to June 2009. SMB represents the size effect and is calculated as the average monthly spread between the return on small and big stocks for a given BE/ME portfolio. HML represents the value effect and is calculated as the average monthly spread between the return on high and low BE/ME stocks for a given size portfolio. Mean SMB and HML represents the average size and value effect across all portfolios. The last two panels present the average size (in €m) and BE/ME of each portfolio at the time of portfolio formation from 1988 to 2008. The breaks indicate the level beyond which a company is sorted into the respective portfolio. Returns, as well as size and BE/ME, are denominated in Euros.

Table 6: Time-Series Regression Results on 16 Portfolios: $r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + e_{p,m}$

	Ex Financial Crisis: 1988:07 - 2007:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.000	-0.005	-0.001	-0.010	-0.002	-0.001	0.000	-0.002	-0.006	-0.004	-0.007	-0.007	-0.003	-0.009	-0.004	-0.006
	(-0.078)	(-1.392)	(-0.467)	(-1.759)	(-0.587)	(-0.350)	(-0.142)	(-0.605)	(-1.652)	(-1.172)	(-2.020)	(-2.778)	(-1.063)	(-3.435)	(-1.405)	(-2.095)
				*					*		**	***		***		**
$\hat{b}_p$	0.957	0.858	0.689	0.714	0.892	0.687	0.514	0.588	1.029	0.808	0.771	0.612	0.823	0.815	0.663	0.716
	(8.219)	(8.145)	(6.696)	(4.973)	(10.200)	(10.427)	(8.793)	(8.867)	(13.113)	(12.226)	(10.289)	(9.526)	(10.394)	(9.634)	(11.381)	(10.615)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.138	0.432	0.024	0.102	-0.164	-0.247	-0.061	-0.127	-0.424	-0.341	-0.146	-0.158	-0.684	-0.545	-0.341	-0.074
	(0.822)	(1.692)	(0.229)	(0.305)	(-1.034)	(-1.655)	(-0.458)	(-0.953)	(-2.486)	(-2.425)	(-0.937)	(-1.070)	(-3.812)	(-3.441)	(-2.581)	(-0.483)
		*				*			**	**			***	***	**	
$\hat{h}_p$	0.501	0.498	0.328	0.283	0.570	0.345	0.194	0.431	0.551	0.468	0.403	0.346	0.600	0.631	0.411	0.496
	(3.867)	(4.995)	(2.621)	(1.429)	(6.730)	(3.427)	(2.173)	(4.391)	(5.026)	(4.845)	(4.410)	(3.955)	(5.567)	(6.281)	(4.613)	(4.813)
	***	***	***		***	***	**	***	***	***	***	***	***	***	***	***
F-Stat	44.620	39.610	31.520	19.340	61.030	41.500	27.890	31.150	80.220	61.060	70.540	42.560	64.770	64.380	52.200	40.830
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.366	0.338	0.287	0.195	0.442	0.349	0.262	0.285	0.512	0.443	0.479	0.355	0.457	0.456	0.404	0.345
Obs.	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228

Table 6 (cont'd): Time-Series Regression Results on 16 Portfolios: $r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + e_{p,m}$

	Subsample I: 1988:07 - 1998:12															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.000	-0.007	-0.002	-0.014	-0.004	0.001	-0.002	0.001	-0.008	-0.006	-0.011	-0.010	-0.005	-0.007	-0.003	-0.013
	(0.037)	(-1.702)	(-0.406)	(-2.036)	(-0.892)	(0.148)	(-0.698)	(0.157)	(-1.825)	(-1.531)	(-2.899)	(-2.917)	(-1.080)	(-1.741)	(-0.916)	(-3.114)
		*		**					*		***	***		*		***
$\hat{b}_p$	1.206	1.037	0.824	0.883	1.066	0.883	0.534	0.673	1.132	0.964	0.906	0.646	0.921	0.972	0.709	0.619
	(8.889)	(7.386)	(7.326)	(5.481)	(9.879)	(8.845)	(6.870)	(9.472)	(8.975)	(8.099)	(10.566)	(7.854)	(8.897)	(7.443)	(8.475)	(6.475)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.436	0.797	0.144	0.239	-0.006	0.016	-0.067	-0.143	-0.479	-0.086	-0.141	-0.075	-0.697	-0.365	-0.307	-0.131
	(1.372)	(1.855)	(0.799)	(0.482)	(-0.024)	(0.067)	(-0.417)	(-0.714)	(-1.656)	(-0.338)	(-0.701)	(-0.390)	(-2.878)	(-1.624)	(-1.565)	(-0.587)
		*											***			
$\hat{h}_p$	0.223	0.393	0.641	0.097	0.251	-0.091	-0.096	0.228	0.500	0.011	0.372	0.192	0.495	0.131	0.110	0.971
	(0.623)	(1.232)	(2.049)	(0.194)	(0.879)	(-0.346)	(-0.341)	(0.792)	(1.514)	(0.043)	(1.640)	(0.883)	(1.811)	(0.417)	(0.500)	(3.847)
			**										*			***
F-Stat	28.800	23.620	19.600	11.310	38.450	29.460	13.400	22.490	50.300	40.280	47.100	25.250	41.620	42.550	31.890	24.510
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.400	0.352	0.309	0.198	0.473	0.406	0.229	0.340	0.542	0.485	0.525	0.368	0.494	0.499	0.426	0.361
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

Table 6 (cont'd): Time-Series Regression Results on 16 Portfolios: $r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + e_{p,m}$

	Subsample II: 1999:01:2009:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	-0.003	0.004	-0.001	-0.003	0.001	-0.003	-0.004	-0.006	-0.001	-0.001	-0.004	-0.011	-0.004	-0.008	-0.007	-0.006
	(-0.471)	(1.138)	(-0.287)	(-0.779)	(0.243)	(-0.625)	(-0.880)	(-1.476)	(-0.268)	(-0.233)	(-0.866)	(-2.194)	(-0.910)	(-1.948)	(-1.711)	(-1.297)
												**		*	*	
$\hat{b}_p$	0.891	0.712	0.584	0.607	0.892	0.727	0.752	0.620	0.904	0.919	0.749	0.750	0.865	0.815	0.754	0.865
	(5.410)	(11.468)	(6.480)	(7.303)	(7.973)	(7.074)	(5.199)	(5.976)	(9.496)	(6.601)	(7.919)	(10.130)	(7.603)	(7.588)	(9.133)	(6.581)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.085	0.048	-0.017	-0.081	-0.281	-0.345	0.060	0.034	-0.502	-0.820	-0.771	-0.505	-0.942	-0.713	-0.604	-0.366
	(0.276)	(0.300)	(-0.113)	(-0.334)	(-1.509)	(-1.887)	(0.295)	(0.207)	(-2.044)	(-2.392)	(-1.616)	(-2.059)	(-3.286)	(-2.999)	(-2.863)	(-1.598)
						*			**	**		**	***	***	***	
$\hat{h}_p$	0.504	0.335	0.188	0.204	0.601	0.447	0.442	0.494	0.494	0.652	0.509	0.544	0.745	0.744	0.625	0.528
	(2.675)	(3.600)	(2.181)	(1.531)	(5.216)	(3.512)	(3.467)	(4.128)	(3.779)	(3.975)	(2.364)	(3.801)	(4.824)	(4.907)	(5.040)	(4.018)
	***	***	**		***	***	***	***	***	***	**	***	***	***	***	***
F-Stat	41.430	49.410	42.370	28.210	72.920	46.740	46.420	28.510	64.130	70.860	37.170	36.340	60.240	67.300	43.380	49.460
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.493	0.537	0.498	0.395	0.633	0.523	0.522	0.398	0.602	0.626	0.465	0.459	0.587	0.614	0.504	0.538
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

The table presents the results of the ordinary least squares three-factor regressions of Equation (12a). The regression is performed on the full sample, excluding the financial crisis as well as two subsamples. All returns are discrete, equally-weighted monthly excess returns and denominated in Euros. rm, SMB and HML are calculated using all general equities. rm represents the excess market return. SMB, Small minus Big, is the average return on the three small-stock portfolios, minus the average return on the three big-stock portfolios. HML, High minus Low, is the average return on the two high BE/ME portfolios, minus the average return on the two low BE/ME portfolios. rf represents the risk-free rate. The test assets are 16 real estate equity portfolios. The portfolios are formed by a two-sequence sorting procedure using size and BE/ME as described in Section 4. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. T-values are reported in parenthesis and either unadjusted or – where necessary – adjusted for heteroskedasticity and/or serial correlation using either White (1980) HC3 or Newey and West (1987) standard errors with an appropriate number of lags. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).

Table 7: Time-Series Regression Results on 16 Portfolios: $r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^1_{p,m}(rm_m - rf_m)^2_{\wedge} + e_{p,m}$

	Ex Financial Crisis: 1988:07 - 2007:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.001	-0.005	-0.003	-0.011	-0.003	-0.001	-0.001	0.000	-0.006	-0.005	-0.007	-0.006	-0.002	-0.007	-0.003	-0.006
	(0.203)	(-1.228)	(-0.939)	(-1.711)	(-0.830)	(-0.166)	(-0.216)	(0.100)	(-1.612)	(-1.131)	(-1.947)	(-2.175)	(-0.494)	(-2.198)	(-1.155)	(-1.777)
				*							*	**		**		*
$\hat{b}_p$	0.960	0.857	0.685	0.712	0.891	0.688	0.514	0.592	1.029	0.807	0.770	0.615	0.826	0.818	0.664	0.717
	(7.848)	(8.099)	(7.185)	(5.571)	(12.845)	(10.409)	(8.755)	(9.295)	(14.332)	(12.252)	(10.676)	(10.745)	(10.379)	(9.950)	(11.353)	(10.589)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.160	0.431	-0.004	0.086	-0.177	-0.240	-0.065	-0.095	-0.423	-0.347	-0.154	-0.137	-0.662	-0.523	-0.337	-0.069
	(0.968)	(1.696)	(-0.042)	(0.271)	(-1.113)	(-1.581)	(-0.483)	(-0.708)	(-2.570)	(-2.357)	(-1.076)	(-1.042)	(-3.754)	(-3.456)	(-2.511)	(-0.447)
		*							**	**			***	***	**	
$\hat{h}_p$	0.506	0.498	0.322	0.280	0.567	0.347	0.193	0.438	0.551	0.467	0.401	0.351	0.605	0.636	0.412	0.497
	(3.732)	(5.000)	(2.809)	(1.383)	(5.351)	(3.432)	(2.155)	(4.287)	(5.020)	(4.816)	(4.471)	(4.010)	(5.538)	(6.704)	(4.607)	(4.805)
	***	***	***		***	***	**	***	***	***	***	***	***	***	***	***
$\hat{g}^1_p$	-0.814	0.053	1.055	0.571	0.481	-0.277	0.152	-1.162	-0.035	0.209	0.305	-0.777	-0.822	-0.799	-0.157	-0.163
	(-0.731)	(0.048)	(1.100)	(0.495)	(0.526)	(-0.318)	(0.196)	(-1.755)	(-0.037)	(0.232)	(0.304)	(-1.029)	(-0.735)	(-0.846)	(-0.203)	(-0.182)
								*								
F-Stat	33.53	29.57	23.97	14.50	45.69	31.03	20.84	23.92	59.90	45.62	52.76	32.19	48.73	48.45	38.99	30.50
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.364	0.335	0.288	0.192	0.441	0.346	0.259	0.288	0.509	0.440	0.477	0.355	0.457	0.455	0.401	0.342
Obs.	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228

Table 7 (cont'd): Time-Series Regression Results on 16 Portfolios:

$$r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^1_{p,m}(rm_m - rf_m)^2_{\wedge} + e_{p,m}$$

	Subsample I: 1988:07 - 1998:12															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.003	-0.006	-0.006	-0.017	-0.006	0.000	-0.004	0.000	-0.007	-0.007	-0.011	-0.009	-0.005	-0.008	-0.006	-0.014
	(0.506)	(-1.125)	(-1.302)	(-2.201)	(-1.277)	(-0.001)	(-1.109)	(0.139)	(-1.546)	(-1.565)	(-2.668)	(-2.267)	(-1.043)	(-1.663)	(-1.581)	(-3.070)
				**							***	**		*		***
$\hat{b}_p$	1.211	1.039	0.817	0.878	1.061	0.882	0.531	0.673	1.133	0.962	0.906	0.649	0.921	0.971	0.704	0.617
	(8.938)	(7.399)	(8.397)	(4.117)	(9.848)	(8.797)	(6.544)	(9.153)	(8.718)	(8.048)	(10.515)	(7.885)	(6.779)	(6.986)	(8.491)	(6.434)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.502	0.824	0.054	0.169	-0.057	0.002	-0.098	-0.145	-0.466	-0.111	-0.143	-0.041	-0.697	-0.378	-0.369	-0.153
	(1.558)	(1.984)	(0.274)	(0.311)	(-0.222)	(0.007)	(-0.667)	(-0.712)	(-1.550)	(-0.431)	(-0.697)	(-0.207)	(-2.169)	(-1.636)	(-1.874)	(-0.673)
		**											**		*	
$\hat{h}_p$	0.289	0.420	0.552	0.027	0.200	-0.105	-0.126	0.226	0.512	-0.015	0.370	0.226	0.496	0.118	0.048	0.949
	(0.797)	(1.331)	(1.965)	(0.051)	(0.695)	(-0.393)	(-0.446)	(0.747)	(1.540)	(-0.058)	(1.606)	(1.029)	(1.487)	(0.378)	(0.218)	(3.706)
			*													***
$\hat{g}^1_p$	-2.150	-0.892	2.932	2.290	1.660	0.459	1.012	0.073	-0.419	0.842	0.063	-1.126	-0.030	0.433	2.042	0.718
	(-1.182)	(-0.448)	(2.724)	(0.977)	(1.147)	(0.341)	(0.912)	(0.082)	(-0.326)	(0.778)	(0.054)	(-1.020)	(-0.014)	(0.251)	(1.836)	(0.558)
			***												*	
F-Stat	22.02	17.67	15.79	8.78	29.24	21.96	10.19	16.73	37.46	30.17	35.04	19.21	30.96	31.71	25.23	18.35
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.402	0.348	0.321	0.199	0.475	0.402	0.227	0.335	0.539	0.483	0.521	0.368	0.490	0.496	0.437	0.357
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

Table 7 (cont'd): Time-Series Regression Results on 16 Portfolios:

$$r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^1_{p,m}(rm_m - rf_m)^2_{\wedge} + e_{p,m}$$

	Subsample II: 1999:01:2009:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.006	0.007	0.000	-0.001	0.003	0.000	-0.004	0.002	-0.005	-0.003	-0.005	-0.015	-0.003	-0.007	-0.005	-0.001
	(1.127)	(1.870)	(-0.015)	(-0.228)	(0.695)	(-0.079)	(-0.975)	(0.525)	(-0.804)	(-0.388)	(-0.989)	(-2.270)	(-0.590)	(-1.068)	(-1.067)	(-0.092)
		*										**				
$\hat{b}_p$	0.871	0.703	0.583	0.602	0.886	0.722	0.752	0.603	0.912	0.923	0.751	0.759	0.862	0.811	0.750	0.853
	(6.965)	(6.029)	(6.205)	(6.645)	(7.125)	(6.457)	(5.341)	(8.835)	(7.634)	(4.886)	(7.522)	(9.069)	(7.857)	(6.105)	(9.049)	(6.282)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.003	0.014	-0.023	-0.100	-0.302	-0.365	0.058	-0.034	-0.471	-0.804	-0.763	-0.469	-0.953	-0.730	-0.623	-0.414
	(0.012)	(0.084)	(-0.150)	(-0.378)	(-1.389)	(-1.763)	(0.296)	(-0.193)	(-2.061)	(-2.226)	(-1.615)	(-2.096)	(-3.261)	(-2.592)	(-2.931)	(-1.450)
						*			**	**		**	***	**	***	
$\hat{h}_p$	0.452	0.314	0.184	0.192	0.588	0.434	0.441	0.451	0.514	0.662	0.514	0.567	0.737	0.734	0.613	0.498
	(2.725)	(2.792)	(1.999)	(1.363)	(4.791)	(3.299)	(3.591)	(4.388)	(3.523)	(3.328)	(2.424)	(3.886)	(4.810)	(4.281)	(4.914)	(3.496)
	***	***	**		***	***	***	***	***	***	**	***	***	***	***	***
$\hat{g}^1_p$	-3.065	-1.243	-0.224	-0.699	-0.772	-0.751	-0.051	-2.540	1.172	0.598	0.306	1.361	-0.435	-0.608	-0.674	-1.783
	(-2.448)	(-0.829)	(-0.263)	(-0.682)	(-0.469)	(-0.542)	(-0.057)	(-3.902)	(0.677)	(0.204)	(0.243)	(1.579)	(-0.564)	(-0.294)	(-0.853)	(-0.902)
	**							***								
F-Stat	39.03	39.26	31.60	21.42	55.23	35.43	34.53	27.68	49.39	53.13	27.71	28.33	44.98	50.56	32.64	39.82
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.549	0.550	0.495	0.395	0.634	0.524	0.518	0.461	0.608	0.625	0.461	0.467	0.585	0.613	0.503	0.554
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

The table presents the results of the ordinary least squares three-factor regressions of Equation (12b). The regression is performed on the full sample, excluding the financial crisis as well as two subsamples. All returns are discrete, equally-weighted monthly excess returns and denominated in Euros. rm, SMB, HML are calculated using all general equities. rm represents the excess market return. SMB, Small minus Big, is the average return on the three small-stock portfolios, minus the average return on the three big-stock portfolios. HML, High minus Low, is the average return on the two high BE/ME portfolios, minus the average return on the two low BE/ME portfolios. rf represents the risk-free rate. $(rm_m - rf_m)^2_{\wedge}$ is the orthogonalised squared excess market return. The test assets are 16 real estate equity portfolios. The portfolios are formed by a two-sequence sorting procedure using size and BE/ME as described in Section 4. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. T-values are reported in parenthesis and either unadjusted or – where necessary – adjusted for heteroskedasticity and/or serial correlation using either White (1980) HC3 or Newey and

West (1987) standard errors with an appropriate number of lags. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).

Table 8: Time-Series Regression Results on 16 Portfolios: $r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^2_{p,m}\left(rm_m - \overline{rm}\right)^2_{\wedge} + e_{p,m}$

	Ex Financial Crisis: 1988:07 - 2007:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.001	-0.005	-0.003	-0.011	-0.003	-0.001	-0.001	0.000	-0.006	-0.005	-0.007	-0.006	-0.002	-0.008	-0.003	-0.006
	(0.131)	(-1.294)	(-0.999)	(-1.753)	(-0.931)	(-0.222)	(-0.218)	(0.058)	(-1.687)	(-1.184)	(-2.023)	(-2.209)	(-0.541)	(-2.292)	(-1.063)	(-1.736)
				*					*		**	**		**		*
$\hat{b}_p$	0.959	0.857	0.684	0.711	0.890	0.688	0.514	0.592	1.028	0.807	0.769	0.615	0.826	0.818	0.664	0.717
	(7.878)	(8.125)	(7.243)	(5.597)	(12.835)	(10.400)	(8.751)	(9.241)	(14.320)	(12.267)	(10.723)	(10.742)	(10.208)	(9.870)	(11.036)	(10.594)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.154	0.426	-0.007	0.082	-0.182	-0.243	-0.065	-0.098	-0.427	-0.350	-0.158	-0.138	-0.665	-0.529	-0.338	-0.067
	(0.927)	(1.676)	(-0.062)	(0.260)	(-1.146)	(-1.602)	(-0.483)	(-0.725)	(-2.596)	(-2.393)	(-1.096)	(-1.055)	(-3.742)	(-3.476)	(-2.341)	(-0.432)
		*							**	**			***	***	**	
$\hat{h}_p$	0.506	0.496	0.318	0.277	0.564	0.347	0.193	0.440	0.550	0.466	0.400	0.352	0.605	0.636	0.412	0.499
	(3.738)	(4.990)	(2.824)	(1.381)	(5.321)	(3.425)	(2.148)	(4.294)	(5.003)	(4.796)	(4.460)	(4.020)	(5.578)	(6.631)	(5.871)	(4.811)
	***	***	***		***	***	**	***	***	***	***	***	***	***	***	***
$\hat{g}^2_p$	-0.620	0.245	1.168	0.733	0.689	-0.173	0.158	-1.103	0.115	0.337	0.437	-0.739	-0.702	-0.606	-0.121	-0.256
	(-0.584)	(0.224)	(1.220)	(0.640)	(0.750)	(-0.197)	(0.203)	(-1.680)	(0.121)	(0.386)	(0.438)	(-0.974)	(-0.621)	(-0.647)	(-0.116)	(-0.285)
								*								
F-Stat	33.44	29.59	24.06	14.54	45.82	31.00	20.84	23.85	59.91	45.66	52.84	32.15	48.63	48.28	38.98	30.52
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.364	0.335	0.289	0.193	0.441	0.346	0.259	0.287	0.509	0.440	0.477	0.354	0.456	0.455	0.401	0.342
Obs.	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228	228

Table 8 (cont'd): Time-Series Regression Results on 16 Portfolios:

$$r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^2_{p,m}\left(rm_m - \overline{rm}\right)^2_{\wedge} + e_{p,m}$$

	Subsample I: 1988:07 - 1998:12															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.003	-0.006	-0.006	-0.018	-0.007	0.000	-0.004	0.000	-0.007	-0.007	-0.011	-0.009	-0.005	-0.008	-0.006	-0.013
	(0.443)	(-1.164)	(-1.294)	(-2.408)	(-1.320)	(0.009)	(-0.988)	(0.140)	(-1.580)	(-1.586)	(-2.676)	(-2.290)	(-0.993)	(-1.718)	(-1.586)	(-3.045)
				**							***	**		*		***
$\hat{b}_p$	1.211	1.039	0.817	0.878	1.061	0.882	0.531	0.673	1.133	0.962	0.906	0.648	0.921	0.970	0.703	0.617
	(7.137)	(7.379)	(8.377)	(5.761)	(9.855)	(8.797)	(7.191)	(9.170)	(8.683)	(8.041)	(10.515)	(7.880)	(8.855)	(6.967)	(8.492)	(6.434)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.501	0.819	0.053	0.166	-0.063	0.002	-0.099	-0.145	-0.469	-0.114	-0.143	-0.042	-0.698	-0.384	-0.371	-0.151
	(1.981)	(1.966)	(0.270)	(0.338)	(-0.245)	(0.010)	(-0.612)	(-0.712)	(-1.558)	(-0.442)	(-0.699)	(-0.214)	(-2.825)	(-1.658)	(-1.882)	(-0.663)
	*	*											***	*	*	
$\hat{h}_p$	0.289	0.416	0.550	0.024	0.194	-0.105	-0.127	0.226	0.509	-0.018	0.369	0.225	0.494	0.112	0.046	0.951
	(1.233)	(1.317)	(1.960)	(0.049)	(0.674)	(-0.390)	(-0.438)	(0.747)	(1.531)	(-0.068)	(1.602)	(1.024)	(1.779)	(0.359)	(0.208)	(3.711)
			*										*			***
$\hat{g}^2_p$	-2.121	-0.732	2.940	2.358	1.830	0.430	1.033	0.068	-0.305	0.913	0.081	-1.076	0.020	0.615	2.077	0.641
	(-1.035)	(-0.360)	(2.631)	(1.457)	(1.257)	(0.317)	(0.875)	(0.078)	(-0.228)	(0.855)	(0.069)	(-0.968)	(0.014)	(0.352)	(1.855)	(0.494)
			***												*	
F-Stat	21.99	17.64	15.78	8.80	29.37	21.96	10.20	16.73	37.44	30.21	35.04	19.16	30.96	31.76	25.26	18.33
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.402	0.347	0.321	0.200	0.476	0.401	0.227	0.335	0.538	0.483	0.521	0.368	0.490	0.496	0.437	0.357
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

Table 8 (cont'd): Time-Series Regression Results on 16 Portfolios:

$$r_{p,m} - rf_m = a_{p,m} + \hat{b}_{p,m}(rm_m - rf_m) + \hat{s}_{p,m}SMB_m + \hat{h}_{p,m}HML_m + \hat{g}^2_{p,m}\left(rm_m - \overline{rm}\right)^2_{\wedge} + e_{p,m}$$

	Subsample II: 1999:01:2009:06															
	S1/B1	S1/B2	S1/B3	S1/B4	S2/B1	S2/B2	S2/B3	S2/B4	S3/B1	S3/B2	S3/B3	S3/B4	S4/B1	S4/B2	S4/B3	S4/B4
a_p	0.006	0.008	0.000	-0.001	0.003	0.000	-0.004	0.002	-0.005	-0.003	-0.005	-0.015	-0.003	-0.007	-0.005	0.000
	(1.131)	(1.879)	(-0.008)	(-0.228)	(0.694)	(-0.074)	(-0.970)	(0.645)	(-0.807)	(-0.390)	(-0.993)	(-2.265)	(-0.586)	(-1.063)	(-1.061)	(-0.081)
		*										***				
$\hat{b}_p$	0.870	0.703	0.583	0.602	0.886	0.722	0.752	0.602	0.913	0.923	0.752	0.759	0.862	0.811	0.750	0.853
	(6.937)	(6.054)	(6.196)	(6.642)	(7.131)	(6.461)	(5.338)	(11.255)	(7.642)	(4.894)	(7.527)	(9.057)	(7.856)	(6.108)	(9.045)	(6.283)
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
$\hat{s}_p$	0.002	0.013	-0.023	-0.100	-0.302	-0.365	0.058	-0.035	-0.470	-0.804	-0.763	-0.468	-0.954	-0.730	-0.623	-0.415
	(0.008)	(0.078)	(-0.152)	(-0.379)	(-1.395)	(-1.768)	(0.295)	(-0.208)	(-2.063)	(-2.233)	(-1.615)	(-2.093)	(-3.260)	(-2.602)	(-2.932)	(-1.456)
						*			**	**		**	***	**	***	
$\hat{h}_p$	0.449	0.313	0.184	0.191	0.588	0.433	0.441	0.449	0.515	0.663	0.515	0.568	0.737	0.733	0.613	0.496
	(2.703)	(2.793)	(1.986)	(1.357)	(4.787)	(3.292)	(3.587)	(4.275)	(3.524)	(3.324)	(2.429)	(3.888)	(4.807)	(4.269)	(4.904)	(3.473)
	***	***	**		***	***	***	***	***	***	**	***	***	***	***	***
$\hat{g}^2_p$	-3.097	-1.276	-0.233	-0.700	-0.777	-0.761	-0.053	-2.578	1.190	0.609	0.317	1.385	-0.442	-0.612	-0.682	-1.814
	(-2.410)	(-0.840)	(-0.270)	(-0.680)	(-0.466)	(-0.543)	(-0.058)	(-5.970)	(0.680)	(0.206)	(0.248)	(1.567)	(-0.565)	(-0.294)	(-0.851)	(-0.909)
	**							***								
F-Stat	38.94	39.31	31.61	21.40	55.21	35.42	34.53	27.67	49.39	53.14	27.71	28.34	44.98	50.55	32.64	39.83
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.548	0.551	0.495	0.395	0.634	0.524	0.518	0.461	0.608	0.625	0.461	0.467	0.585	0.613	0.503	0.554
Obs.	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

The table presents the results of the ordinary least squares three-factor regressions of Equation (12c). The regression is performed on the full sample, excluding the financial crisis as well as two subsamples. All returns are discrete, equally-weighted monthly excess returns and denominated in Euros. rm, SMB, HML are calculated using all general equities. rm represents the excess market return. SMB, Small minus Big, is the average return on the three small-stock portfolios, minus the average return on the three big-stock portfolios. HML, High minus Low, is the average return on the two high BE/ME portfolios, minus the average return on the two low BE/ME portfolios. rf represents the risk-free rate. $\left(rm_m - \overline{rm}_m\right)^2_{\wedge}$ is the orthogonalised squared market return deviation. The test assets are 16 real estate equity portfolios. The portfolios are formed by a two-sequence sorting procedure using size and BE/ME as described in Section 4. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. T-values are reported in parenthesis and either unadjusted or – where necessary – adjusted for heteroskedasticity and/or serial correlation using either White (1980) HC3 or Newey and

West (1987) standard errors with an appropriate number of lags. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).

Table 9: Returns and Characteristics of 16 Real Estate Equity Portfolios Formed on Size and BE/ME Excluding Country Effects

Real Estate Equities							
	Panel I: Returns						
	B1	B2	B3	B4	Mean	HML	t(HML)
S1	0.91%	0.95%	0.49%	-0.02%		0.93%	2.10
S2	1.38%	1.01%	0.52%	0.19%		1.19%	3.97
S3	0.78%	0.58%	0.84%	0.07%		0.70%	2.36
S4	1.03%	1.05%	0.65%	0.08%		0.96%	3.76
Mean						0.94%	5.26
SMB	-0.12%	-0.10%	-0.17%	-0.09%	-0.12%		
t(SMB)	-0.36	-0.28	-0.52	-0.23	-0.54		
Obs.	252	252	252	252			
	Panel II: Size						
	B1	B2	B3	B4		Mean	Break
S1	108.38	129.74	128.37	127.47		122.89	< -0.72
S2	268.96	287.33	278.60	265.26		274.31	< -0.42
S3	466.27	587.97	583.93	513.80		533.80	< 0.22
S4	1639.77	1897.15	1514.80	1786.73		1704.02	> 0.22
Mean	627.06	735.61	629.06	683.31		665.80	
Obs.	252	252	252	252			
	Panel III: BE/ME						
	B1	B2	B3	B4		Mean	Obs.
S1	1.47	1.21	1.08	0.72		1.12	252
S2	2.33	1.10	0.95	0.67		1.29	252
S3	1.64	0.93	5.05	0.67		2.06	252
S4	1.30	1.01	0.79	0.56		0.92	252
Mean	1.68	1.06	1.93	0.65		1.34	
Break	> 0.16	> -0.01	> -0.22	< -0.22			

The table presents the returns and characteristics of 16 real estate equity portfolios formed on size and BE/ME after country effects have been excluded as described in Section 8.1. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June year t, all real estate equities are ranked on size, measured by market capitalization and sorted into four size portfolios according to the size quartiles. Subsequently, all real estate equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into four BE/ME portfolios according to the BE/ME quartiles. The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 to S4 represent the four size portfolios from smallest to largest. B1 to B4 represent the sub-division into four BE/ME portfolios from highest to lowest. The first panel presents the discrete, equally-weighted average monthly returns on all equities in the 16 real estate equity portfolios from July 1988 to June 2009. SMB represents the size effect and is calculated as the average monthly spread between the return on small and big stocks for a given BE/ME portfolio. HML represents the value effect and is calculated as the average monthly spread between the return on high and low BE/ME stocks for a given size portfolio. Mean SMB and HML represents the average size and value effect across all portfolios. The last two panels present the average size (in €m) and BE/ME of each portfolio at the time of portfolio formation from 1988 to 2008. The breaks indicate the level beyond which a company is sorted into the respective portfolio. Returns, as well as size and BE/ME, are denominated in Euros.

Table 10: Returns and Characteristics of Six General Equity Portfolios Formed on Size and BE/ME Excluding Country Effects

General Equities						
	Panel I: Returns					
	B1	B2	B3	Mean	HML	t(HML)
S1	1.42%	0.70%	0.19%		1.24%	6.76
S2	1.07%	0.66%	0.41%		0.66%	4.24
Mean					0.95%	6.02
SMB	0.35%	0.05%	-0.22%	0.06%		
t(SMB)	2.54	0.45	-1.58	0.52		
Obs.	252	252	252			
	Panel II: Size					
	B1	B2	B3		Mean	Break
S1	36.97	46.54	57.46		46.95	< -0.85
S2	1721.82	2462.53	3051.67		2417.02	> -0.85
Mean	879.22	1254.53	1554.38		1231.87	
Obs.	252	252	252			
	Panel III: BE/ME					
	B1	B2	B3		Mean	Obs.
S1	5.69	0.73	0.34		2.10	252
S2	2.95	0.60	0.38		1.24	252
Mean	4.32	0.67	0.36		1.67	
Break	> -0.02	> -0.58	< -0.58			

The table presents the returns and characteristics of six general equity portfolios formed on size and BE/ME after country effects have been excluded as described in Section 8.1. The portfolios are formed by a two-sequence sorting procedure following Liew and Vassalou (2000). At the end of June year t, all general equities are ranked on size, measured by market capitalization and sorted into two size portfolios according to the size median. Subsequently, all general equities in each size portfolio are ranked on BE/ME and each portfolio is subdivided into three BE/ME portfolios (30-40-30). The portfolio sorting is maintained for the following 12 months and repeated at the end of each June year t. S1 to S2 represent the two size portfolios from smallest to largest. B1 to B3 represent the sub-division into three BE/ME portfolios from highest to lowest. The first panel presents the discrete, equally-weighted average monthly returns on all equities in the 16 general equity portfolios from July 1988 to June 2009. SMB represents the size effect and is calculated as the average monthly spread between the return on small and big stocks for a given BE/ME portfolio. HML represents the value effect and is calculated as the average monthly spread between the return on high and low BE/ME stocks for a given size portfolio. Mean SMB and HML represents the average size and value effect across all portfolios. The last two panels present the average size (in €m) and BE/ME of each portfolio at the time of portfolio formation from 1988 to 2008. The breaks indicate the level beyond which a company is sorted into the respective portfolio. Returns, as well as size and BE/ME, are denominated in Euros.

Table 11: Cross-Section Regression Results - Robustness Check Excluding Country Effects

	Panel I: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.018	0.005	0.013	0.038	0.039	0.023	0.045	-0.030	-0.016	-0.024	-0.033	0.047	0.048	0.033	0.053	-0.039	-0.030	-0.020	-0.054
	(1.488)	(3.178)	(0.755)	(1.321)	(9.179)	(8.660)	(5.181)	(8.582)	(-4.929)	(-3.797)	(-6.923)	(-3.644)	(15.962)	(15.342)	(9.379)	(14.606)	(-9.124)	(-9.986)	(-7.482)	(-9.606)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.004	-0.004	-0.003	-0.004	-0.008	-0.008	-0.007	-0.009	0.003	0.002	0.004	0.003	-0.011	-0.010	-0.008	-0.013	0.007	0.004	0.002	0.011
	(-1.647)	(-2.190)	(-1.161)	(-1.301)	(-4.364)	(-4.034)	(-4.248)	(-3.198)	(1.788)	(1.234)	(1.884)	(1.216)	(-4.807)	(-4.896)	(-3.744)	(-3.853)	(2.871)	(2.524)	(0.716)	(3.060)
		**			***	***	***	***	*		*		***	***	***	***	***	**		***
λ_h	0.001	0.000	0.002	0.001	-0.002	-0.002	0.003	-0.004	0.005	0.002	0.000	0.008	-0.001	-0.002	0.001	-0.002	0.004	0.002	0.002	0.005
	(0.301)	(-0.083)	(0.689)	(0.141)	(-0.463)	(-0.457)	(1.384)	(-0.756)	(1.828)	(0.690)	(-0.104)	(1.928)	(-0.250)	(-0.436)	(0.306)	(-0.302)	(1.348)	(0.722)	(0.766)	(1.141)
									*			*								
F-Stat	10.126	9.021	7.270	11.622	8.462	8.652	6.141	9.717	12.556	9.621	9.006	14.331	9.342	9.343	7.614	10.020	11.177	8.499	6.964	14.314
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.168	0.160	0.142	0.181	0.154	0.159	0.125	0.169	0.187	0.160	0.167	0.198	0.173	0.175	0.162	0.178	0.160	0.135	0.124	0.187
Obs.	192	168	66	126	114	104	40	74	78	64	26	52	110	104	31	79	82	64	35	47

Table 11 (cont'd): Cross-Section Regression Results - Robustness Check Excluding Country Effects

	Panel II: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{g^j,m+1}\hat{g}^j_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.012	0.021	0.005	0.015	0.038	0.042	0.023	0.047	-0.028	-0.013	-0.023	-0.030	0.048	0.049	0.032	0.054	-0.037	-0.025	-0.020	-0.050
	(1.667)	(3.336)	(0.716)	(1.529)	(8.463)	(8.659)	(4.596)	(7.918)	(-4.732)	(-3.366)	(-6.533)	(-3.456)	(12.607)	(11.598)	(8.041)	(11.167)	(-8.051)	(-8.897)	(-7.235)	(-7.695)
	*	***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.004	-0.004	-0.003	-0.005	-0.009	-0.009	-0.007	-0.010	0.003	0.002	0.003	0.004	-0.012	-0.010	-0.008	-0.013	0.007	0.005	0.002	0.010
	(-1.839)	(-2.156)	(-1.177)	(-1.497)	(-4.740)	(-4.296)	(-3.982)	(-3.680)	(1.782)	(1.814)	(1.443)	(1.340)	(-5.012)	(-5.007)	(-4.178)	(-4.004)	(3.070)	(3.186)	(0.740)	(3.309)
	*	**			***	***	***	***	*	*			***	***	***	***	***	***		***
λ_h	0.000	-0.001	0.003	-0.002	-0.002	-0.002	0.004	-0.005	0.002	0.000	0.000	0.003	0.000	-0.001	0.002	-0.001	0.000	-0.002	0.003	-0.003
	(-0.029)	(-0.327)	(1.029)	(-0.327)	(-0.530)	(-0.510)	(1.731)	(-1.041)	(0.856)	(-0.064)	(0.085)	(0.858)	(-0.045)	(-0.207)	(0.692)	(-0.184)	(0.003)	(-0.554)	(1.096)	(-0.612)
							*													
λ_{g^j}	0.000	0.000	-0.001	0.000	-0.001	0.000	-0.002	0.000	0.001	0.001	0.000	0.001	-0.001	-0.001	-0.001	-0.001	0.001	0.002	0.000	0.002
	(-0.166)	(0.361)	(-1.363)	(0.330)	(-1.450)	(-0.550)	(-3.233)	(-0.467)	(1.765)	(2.005)	(0.579)	(1.621)	(-1.787)	(-1.177)	(-3.144)	(-1.101)	(2.100)	(3.431)	(-0.389)	(2.836)
							***		*	*			*		***		**	***		***
F-Stat	8.017	7.145	5.754	9.202	6.773	6.925	4.973	7.746	9.835	7.501	6.955	11.275	7.395	7.412	6.107	7.900	8.851	6.710	5.441	11.391
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.172	0.163	0.145	0.186	0.158	0.164	0.130	0.174	0.191	0.161	0.166	0.203	0.176	0.178	0.168	0.180	0.165	0.137	0.124	0.195
Obs.	192	168	66	126	114	104	40	74	78	64	26	52	110	104	31	79	82	64	35	47

Table 11 (cont'd): Cross-Section Regression Results - Robustness Check Excluding Country Effects

	Panel III: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{g^2,m+1}\hat{g}^2_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.010	0.019	0.005	0.013	0.037	0.039	0.024	0.044	-0.028	-0.013	-0.023	-0.031	0.045	0.046	0.033	0.050	-0.036	-0.023	-0.019	-0.049
λ_b	(1.647)	(3.626)	(0.878)	(1.440)	(9.412)	(9.804)	(5.433)	(8.443)	(-4.961)	(-3.201)	(-6.551)	(-3.657)	(14.032)	(13.357)	(9.776)	(11.794)	(-8.156)	(-7.505)	(-7.143)	(-7.753)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	-0.004	-0.004	-0.003	-0.004	-0.008	-0.008	-0.007	-0.009	0.003	0.002	0.003	0.002	-0.011	-0.009	-0.008	-0.012	0.005	0.004	0.002	0.008
λ_s	(-1.786)	(-1.993)	(-1.099)	(-1.460)	(-4.667)	(-4.277)	(-3.937)	(-3.520)	(1.462)	(1.659)	(1.591)	(0.921)	(-4.465)	(-4.484)	(-4.107)	(-3.445)	(2.464)	(2.506)	(0.853)	(2.430)
	*	**			***	***	***	***					***	***	***	***	**	**		**
	-0.001	-0.001	0.002	-0.002	-0.003	-0.002	0.004	-0.006	0.003	0.000	0.000	0.004	-0.002	-0.003	0.001	-0.003	0.001	0.000	0.003	0.000
λ_h	(-0.152)	(-0.382)	(0.943)	(-0.398)	(-0.792)	(-0.595)	(1.628)	(-1.227)	(0.889)	(-0.069)	(0.055)	(0.898)	(-0.465)	(-0.576)	(0.446)	(-0.547)	(0.457)	(0.079)	(1.093)	(-0.052)
	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	0.001	0.000	0.001	-0.002	-0.002	-0.001	-0.002	0.001	0.002	0.000	0.002
λ_{g^2}	(-1.000)	(-0.316)	(-1.301)	(-0.651)	(-2.172)	(-1.268)	(-2.902)	(-1.556)	(0.868)	(1.322)	(0.202)	(0.853)	(-3.076)	(-2.596)	(-3.059)	(-2.452)	(1.055)	(2.996)	(-0.414)	(1.345)
					**		***						***	**	***	**		***		
F-Stat	8.043	7.140	5.732	9.253	6.836	6.915	4.908	7.878	9.806	7.506	7.000	11.209	7.371	7.380	6.038	7.895	8.943	6.751	5.462	11.536
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.172	0.162	0.143	0.187	0.160	0.163	0.127	0.177	0.189	0.160	0.168	0.200	0.176	0.177	0.164	0.180	0.167	0.138	0.125	0.198
Obs.	192	168	66	126	114	104	40	74	78	64	26	52	110	104	31	79	82	64	35	47

Table 11 (cont'd): Cross-Section Regression Results - Robustness Check Excluding Country Effects

	Panel IV: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{v,m+1}\hat{v}_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.011	0.020	0.005	0.014	0.036	0.039	0.024	0.043	-0.026	-0.012	-0.023	-0.028	0.045	0.045	0.033	0.050	-0.036	-0.023	-0.020	-0.047
λ_b	(1.627)	(3.706)	(0.847)	(1.434)	(8.795)	(9.354)	(5.393)	(7.688)	(-4.419)	(-2.998)	(-6.651)	(-3.132)	(13.881)	(13.211)	(9.859)	(11.597)	(-7.481)	(-7.997)	(-7.320)	(-6.901)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	-0.003	-0.003	-0.001	-0.004	-0.007	-0.006	-0.004	-0.008	0.003	0.002	0.004	0.002	-0.010	-0.008	-0.007	-0.012	0.007	0.004	0.004	0.009
λ_s	(-1.301)	(-1.532)	(-0.351)	(-1.278)	(-3.629)	(-3.217)	(-2.217)	(-3.019)	(1.258)	(1.142)	(1.553)	(0.697)	(-3.839)	(-3.888)	(-3.338)	(-3.038)	(2.347)	(1.932)	(1.199)	(2.049)
					***	***	***	***					***	***	***	***	**	*		**
	0.000	-0.001	0.003	-0.002	-0.003	-0.003	0.005	-0.007	0.004	0.001	0.000	0.006	-0.002	-0.002	0.002	-0.003	0.002	0.001	0.004	0.001
λ_h	(-0.046)	(-0.328)	(1.079)	(-0.328)	(-0.770)	(-0.655)	(1.797)	(-1.276)	(1.225)	(0.239)	(-0.012)	(1.262)	(-0.448)	(-0.553)	(0.674)	(-0.576)	(0.715)	(0.186)	(1.200)	(0.225)
							*													
	-0.005	-0.001	-0.006	-0.004	-0.011	-0.007	-0.010	-0.011	0.003	0.007	0.000	0.005	-0.007	-0.009	-0.005	-0.007	-0.003	0.010	-0.008	0.000
λ_v	(-1.135)	(-0.367)	(-1.139)	(-0.720)	(-2.365)	(-1.538)	(-1.956)	(-1.718)	(0.749)	(1.783)	(0.007)	(0.829)	(-1.602)	(-2.221)	(-0.922)	(-1.325)	(-0.481)	(2.036)	(-1.179)	(0.029)
					**		*	*		*				**				**		
F-Stat	7.988	7.100	5.685	9.195	6.805	6.887	4.860	7.857	9.718	7.447	6.954	11.100	7.345	7.347	5.971	7.884	8.851	6.700	5.431	11.399
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.170	0.161	0.142	0.185	0.159	0.162	0.126	0.176	0.187	0.159	0.166	0.198	0.175	0.176	0.162	0.180	0.164	0.136	0.123	0.195
Obs.	192	168	66	126	114	104	40	74	78	64	26	52	110	104	31	79	82	64	35	47

Table 11 (cont'd): Cross-Section Regression Results - Robustness Check Excluding Country Effects

	Panel V: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{\hat{\nu}^2_{m+1}}\hat{\nu}^2_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.019	0.005	0.013	0.037	0.039	0.024	0.044	-0.028	-0.013	-0.023	-0.031	0.045	0.046	0.033	0.050	-0.036	-0.023	-0.019	-0.049
	(1.647)	(3.626)	(0.878)	(1.440)	(9.412)	(9.804)	(5.433)	(8.443)	(-4.961)	(-3.201)	(-6.551)	(-3.657)	(14.032)	(13.357)	(9.776)	(11.794)	(-8.156)	(-7.505)	(-7.143)	(-7.753)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.003	-0.003	-0.001	-0.004	-0.007	-0.006	-0.004	-0.008	0.003	0.002	0.004	0.002	-0.010	-0.007	-0.007	-0.011	0.007	0.004	0.004	0.008
	(-1.273)	(-1.456)	(-0.364)	(-1.243)	(-3.569)	(-3.202)	(-2.144)	(-2.966)	(1.287)	(1.375)	(1.437)	(0.749)	(-3.797)	(-3.813)	(-3.035)	(-3.028)	(2.530)	(2.216)	(1.169)	(2.289)
					***	***	***	***					***	***	***	***	**	**		**
λ_h	0.000	-0.001	0.003	-0.001	-0.003	-0.003	0.005	-0.007	0.005	0.002	0.000	0.007	-0.002	-0.003	0.003	-0.004	0.003	0.002	0.004	0.003
	(0.084)	(-0.204)	(1.151)	(-0.220)	(-0.739)	(-0.607)	(1.884)	(-1.281)	(1.612)	(0.555)	(-0.010)	(1.674)	(-0.478)	(-0.624)	(0.880)	(-0.648)	(1.175)	(0.743)	(1.177)	(0.734)
							*													
$\lambda_{\hat{\nu}^2}$	-0.006	-0.002	-0.007	-0.005	-0.012	-0.008	-0.012	-0.013	0.004	0.009	0.001	0.005	-0.011	-0.013	-0.008	-0.012	0.001	0.017	-0.006	0.006
	(-0.967)	(-0.282)	(-1.230)	(-0.611)	(-1.947)	(-1.271)	(-2.410)	(-1.348)	(0.648)	(1.560)	(0.150)	(0.631)	(-1.949)	(-2.193)	(-1.723)	(-1.530)	(0.151)	(2.503)	(-0.872)	(0.525)
					*		**						*	**	*			**		
F-Stat	8.043	7.140	5.732	9.253	6.836	6.915	4.908	7.878	9.806	7.506	7.000	11.209	7.371	7.380	6.038	7.895	8.943	6.751	5.462	11.536
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.172	0.162	0.143	0.187	0.160	0.163	0.127	0.177	0.189	0.160	0.168	0.200	0.176	0.177	0.164	0.180	0.167	0.138	0.125	0.198
Obs.	192	168	66	126	114	104	40	74	78	64	26	52	110	104	31	79	82	64	35	47

The table presents the results of the unconditional and conditional Fama-MacBeth regressions of Equation (13a) and (14a) as well as (13b) and (14b) respectively. The unconditional regressions are performed on the full sample, ranging from July 1993 (m=60) to June 2009 (m=252), to June 2007 excluding the financial crisis (m=228) as well as two subsamples from July 1993 (m=60) to December 1998 (m=126) and January 1999 (m=127) to June 2009 (m=252) respectively. The conditional regressions are conditioned both on the general equity market, as well as on the real estate equity market. All returns are discrete, equally-weighted monthly excess returns and denominated in Euros. Monthly individual real estate equity returns in month m+1 are matched to their factor loadings $\hat{b}_{p,m}$, $\hat{s}_{p,m}$ and $\hat{h}_{p,m}$ that are derived from the first-stage five-year rolling time-series regression of 16 real estate equity portfolio returns on $rm - rf$, SMB, and HML as illustrated in Equation (12a) and (12b). $\hat{g}^1_{p,m}$, $\hat{g}^2_{p,m}$, $\hat{\nu}_{p,m}$, $\hat{\nu}^2_{p,m}$ are the coskewness measure as described in

Section 5. Country effects are excluded as described in Section 8.1. Cross-sectional regressions of individual real estate equity returns on the factor loadings and coskewness are performed each month. The reported slope coefficients, F-statistics and adjusted R-squared are the mean values across all cross-sections. T-values are based on Fama-MacBeth (1973) standard errors corrected for serial correlation. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).

Table 12: Cross-Section Regression Results - Robustness Check Using Returns in Local Currency

	Panel I: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + e_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.009	0.014	0.003	0.011	0.033	0.034	0.019	0.041	-0.025	-0.016	-0.020	-0.028	0.038	0.037	0.027	0.042	-0.033	-0.027	-0.020	-0.042
λ_b	(1.466)	(2.622)	(0.582)	(1.355)	(8.000)	(7.306)	(4.159)	(7.484)	(-5.235)	(-4.212)	(-4.861)	(-4.052)	(10.655)	(9.766)	(6.635)	(9.027)	(-7.809)	(-7.624)	(-6.648)	(-7.004)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	-0.001	-0.002	-0.001	-0.001	-0.001	-0.002	-0.003	0.000	0.000	-0.001	0.003	-0.001	-0.005	-0.005	-0.004	-0.006	0.006	0.004	0.002	0.009
λ_s	(-0.336)	(-0.657)	(-0.447)	(-0.201)	(-0.493)	(-0.550)	(-1.454)	(-0.053)	(0.025)	(-0.654)	(1.134)	(-0.420)	(-2.046)	(-1.686)	(-1.148)	(-1.669)	(3.190)	(2.025)	(1.331)	(3.072)
													**	*		*	***	**		***
	0.000	0.000	0.001	-0.001	-0.001	-0.001	0.009	-0.006	0.000	0.002	-0.012	0.006	0.004	0.003	0.011	0.001	-0.007	-0.006	-0.010	-0.005
λ_h	(-0.125)	(-0.061)	(0.164)	(-0.176)	(-0.209)	(-0.310)	(3.652)	(-0.947)	(0.027)	(0.344)	(-5.971)	(1.057)	(0.967)	(0.672)	(3.665)	(0.200)	(-1.909)	(-1.507)	(-4.957)	(-0.852)
							***				***				***		*		***	
F-Stat	10.524	9.308	6.982	12.379	8.965	9.044	5.953	10.596	12.661	9.715	8.468	14.757	9.371	9.245	6.601	10.514	12.173	9.420	7.362	15.624
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.166	0.158	0.133	0.184	0.159	0.162	0.123	0.178	0.177	0.152	0.146	0.192	0.167	0.166	0.137	0.179	0.166	0.144	0.128	0.193
Obs.	192	168	66	126	111	102	39	72	81	66	27	54	113	108	33	80	79	60	33	46

Table 12 (cont'd): Cross-Section Regression Results - Robustness Check with Returns in Local Currency

	Panel II: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{g^j,m+1}\hat{g}^j_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.016	0.003	0.013	0.033	0.034	0.018	0.040	-0.022	-0.013	-0.018	-0.023	0.038	0.038	0.026	0.043	-0.031	-0.025	-0.019	-0.039
	(1.719)	(2.901)	(0.602)	(1.623)	(7.820)	(7.177)	(3.942)	(7.358)	(-4.604)	(-3.379)	(-4.800)	(-3.402)	(11.473)	(10.455)	(6.269)	(10.053)	(-8.218)	(-7.987)	(-7.246)	(-7.198)
	*	***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.002	-0.003	-0.002	-0.002	-0.002	-0.002	-0.004	-0.001	-0.001	-0.003	0.002	-0.003	-0.006	-0.006	-0.005	-0.007	0.005	0.003	0.001	0.007
	(-0.758)	(-1.055)	(-0.891)	(-0.496)	(-0.724)	(-0.750)	(-1.801)	(-0.139)	(-0.629)	(-1.263)	(0.865)	(-0.966)	(-2.471)	(-2.090)	(-1.304)	(-2.019)	(2.503)	(1.424)	(0.839)	(2.494)
							*						**	**		**	**			**
λ_h	-0.002	-0.003	0.000	-0.003	-0.002	-0.003	0.007	-0.007	-0.003	-0.002	-0.012	0.001	0.001	0.000	0.010	-0.002	-0.007	-0.007	-0.011	-0.005
	(-0.607)	(-0.596)	(-0.145)	(-0.589)	(-0.398)	(-0.519)	(2.914)	(-0.995)	(-0.772)	(-0.511)	(-6.374)	(0.239)	(0.303)	(0.011)	(3.351)	(-0.436)	(-2.022)	(-1.752)	(-5.483)	(-0.881)
							***				***				***		**	*	***	
λ_{g^j}	-0.001	-0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.002	0.000	0.000	0.001	0.000	-0.001	-0.001	0.000	-0.002	0.000	0.000	0.000	0.001
	(-1.967)	(-1.906)	(-0.499)	(-1.924)	(-3.361)	(-2.448)	(-2.439)	(-2.730)	(0.247)	(-0.747)	(2.438)	(-0.497)	(-3.840)	(-3.150)	(-1.132)	(-3.619)	(0.819)	(1.325)	(0.151)	(0.857)
	*	*		*	***	**	**	***			**		***	***		***				
F-Stat	8.201	7.306	5.563	9.583	7.064	7.134	4.843	8.267	9.760	7.572	6.604	11.338	7.315	7.226	5.223	8.178	9.469	7.450	5.904	12.027
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.169	0.161	0.136	0.186	0.162	0.165	0.128	0.180	0.178	0.154	0.148	0.193	0.168	0.167	0.137	0.180	0.170	0.149	0.135	0.195
Obs.	192	168	66	126	111	102	39	72	81	66	27	54	113	108	33	80	79	60	33	46

Table 12 (cont'd): Cross-Section Regression Results - Robustness Check with Returns in Local Currency

	Panel III: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{\sigma^2,m+1}\hat{\sigma}^2_{p,m} + e_{i,m+1}$																			
	Unconditional				Stock Market								Real Estate Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.010	0.016	0.004	0.014	0.034	0.035	0.019	0.042	-0.022	-0.014	-0.019	-0.024	0.039	0.039	0.027	0.044	-0.031	-0.025	-0.020	-0.039
λ_b	(1.755)	(2.891)	(0.630)	(1.653)	(7.972)	(7.292)	(4.257)	(7.470)	(-4.756)	(-3.572)	(-4.705)	(-3.519)	(11.058)	(10.140)	(6.795)	(9.505)	(-8.068)	(-8.008)	(-6.756)	(-7.027)
	*	***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.004	-0.001	-0.001	-0.003	0.002	-0.003	-0.006	-0.006	-0.005	-0.007	0.005	0.003	0.002	0.007
λ_s	(-0.714)	(-1.046)	(-0.748)	(-0.496)	(-0.665)	(-0.705)	(-1.556)	(-0.169)	(-0.634)	(-1.354)	(0.741)	(-0.935)	(-2.441)	(-2.041)	(-1.293)	(-2.003)	(2.614)	(1.427)	(1.093)	(2.503)
													**	**		**	**			*
	-0.002	-0.003	0.000	-0.004	-0.002	-0.003	0.008	-0.008	-0.003	-0.002	-0.012	0.002	0.001	0.000	0.010	-0.002	-0.007	-0.007	-0.010	-0.005
λ_h	(-0.611)	(-0.601)	(-0.084)	(-0.610)	(-0.472)	(-0.613)	(3.345)	(-1.129)	(-0.669)	(-0.384)	(-6.751)	(0.364)	(0.271)	(0.014)	(3.548)	(-0.439)	(-2.072)	(-1.886)	(-5.333)	(-0.947)
							***				***				***		**	*	***	
	0.000	0.000	0.000	0.000	-0.001	0.000	-0.001	-0.001	0.000	0.000	0.001	0.000	-0.001	-0.001	0.000	-0.001	0.000	0.000	0.000	0.001
λ_{σ^2}	(-0.945)	(-0.961)	(-0.243)	(-0.929)	(-1.926)	(-1.297)	(-1.852)	(-1.389)	(0.634)	(-0.254)	(2.042)	(-0.091)	(-2.330)	(-1.971)	(-0.422)	(-2.226)	(1.201)	(1.237)	(-0.017)	(1.471)
					*		*				*		**	*		**				
F-Stat	8.171	7.271	5.534	9.552	7.019	7.090	4.809	8.216	9.749	7.552	6.581	11.334	7.274	7.186	5.209	8.126	9.454	7.426	5.859	12.034
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.168	0.160	0.135	0.185	0.160	0.164	0.127	0.179	0.178	0.153	0.147	0.193	0.167	0.166	0.137	0.179	0.169	0.149	0.133	0.194
Obs.	192	168	66	126	111	102	39	72	81	66	27	54	113	108	33	80	79	60	33	46

Table 12 (cont'd): Cross-Section Regression Results - Robustness Check with Returns in Local Currency

	Panel IV: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{v,m+1}\hat{v}_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				Stock Market								Real Estate Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.016	0.004	0.013	0.034	0.035	0.019	0.041	-0.023	-0.014	-0.019	-0.025	0.039	0.038	0.027	0.043	-0.032	-0.025	-0.020	-0.040
	(1.644)	(2.842)	(0.637)	(1.530)	(8.029)	(7.361)	(4.247)	(7.486)	(-4.714)	(-3.568)	(-4.601)	(-3.537)	(11.224)	(10.295)	(6.867)	(9.604)	(-7.937)	(-7.783)	(-6.619)	(-7.018)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.002	0.000	-0.003	-0.004	-0.002	-0.003	-0.006	-0.005	-0.004	-0.006	0.005	0.002	0.000	0.008
	(-0.626)	(-0.942)	(-0.943)	(-0.329)	(-0.203)	(-0.263)	(-0.754)	(0.023)	(-1.279)	(-2.155)	(-1.352)	(-0.866)	(-2.216)	(-1.807)	(-1.384)	(-1.764)	(2.399)	(1.176)	(0.155)	(2.698)
										**			**	*		*	**			**
λ_h	-0.002	-0.003	0.000	-0.004	-0.001	-0.001	0.010	-0.006	-0.005	-0.004	-0.014	0.000	0.002	0.001	0.011	-0.002	-0.008	-0.008	-0.011	-0.006
	(-0.614)	(-0.602)	(-0.015)	(-0.634)	(-0.133)	(-0.285)	(4.422)	(-0.914)	(-1.174)	(-0.880)	(-7.460)	(-0.005)	(0.435)	(0.169)	(4.167)	(-0.382)	(-2.278)	(-2.159)	(-5.312)	(-1.100)
							***				***				***		**	**	***	
λ_v	-0.001	-0.002	0.002	-0.003	-0.006	-0.006	-0.009	-0.004	0.005	0.004	0.018	-0.001	-0.004	-0.005	-0.001	-0.006	0.003	0.003	0.004	0.002
	(-0.461)	(-0.637)	(0.333)	(-0.954)	(-2.472)	(-2.047)	(-2.184)	(-1.443)	(1.940)	(1.340)	(4.153)	(-0.205)	(-1.767)	(-1.793)	(-0.168)	(-2.028)	(1.006)	(1.083)	(0.808)	(0.602)
					**	**	**		*		***		*	*		**				
F-Stat	8.142	7.236	5.475	9.538	6.973	7.041	4.712	8.198	9.743	7.537	6.578	11.325	7.256	7.169	5.168	8.117	9.408	7.357	5.782	12.010
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.167	0.159	0.133	0.185	0.159	0.163	0.123	0.178	0.178	0.153	0.147	0.193	0.166	0.166	0.136	0.179	0.168	0.146	0.131	0.194
Obs.	192	168	66	126	111	102	39	72	81	66	27	54	113	108	33	80	79	60	33	46

Table 12 (cont'd): Cross-Section Regression Results - Robustness Check with Returns in Local Currency

	Panel V: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{\hat{v}^2_{m+1}}\hat{v}^2_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				Stock Market								Real Estate Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.016	0.004	0.014	0.034	0.035	0.019	0.042	-0.022	-0.014	-0.019	-0.024	0.039	0.039	0.027	0.044	-0.031	-0.025	-0.020	-0.039
	(1.755)	(2.891)	(0.630)	(1.653)	(7.972)	(7.292)	(4.257)	(7.470)	(-4.756)	(-3.572)	(-4.705)	(-3.519)	(11.058)	(10.140)	(6.795)	(9.505)	(-8.068)	(-8.008)	(-6.756)	(-7.027)
	*	***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.002	0.000	-0.002	-0.004	-0.002	-0.002	-0.006	-0.005	-0.004	-0.006	0.005	0.003	0.001	0.008
	(-0.572)	(-0.874)	(-0.839)	(-0.316)	(-0.244)	(-0.291)	(-0.762)	(-0.008)	(-1.077)	(-1.925)	(-0.959)	(-0.788)	(-2.182)	(-1.771)	(-1.324)	(-1.754)	(2.535)	(1.369)	(0.361)	(2.762)
										*			**	*		*	**			**
λ_h	-0.003	-0.003	0.000	-0.004	-0.002	-0.003	0.009	-0.008	-0.005	-0.004	-0.014	0.000	0.000	-0.001	0.010	-0.004	-0.008	-0.008	-0.011	-0.006
	(-0.796)	(-0.768)	(-0.128)	(-0.790)	(-0.379)	(-0.527)	(4.155)	(-1.136)	(-1.153)	(-0.832)	(-7.442)	(-0.015)	(0.119)	(-0.149)	(4.061)	(-0.658)	(-2.216)	(-1.979)	(-5.399)	(-1.034)
							***				***				***		**	*	***	
$\lambda_{\hat{v}^2}$	-0.001	-0.002	0.001	-0.002	-0.006	-0.005	-0.007	-0.005	0.005	0.003	0.012	0.002	-0.005	-0.006	-0.001	-0.007	0.005	0.005	0.003	0.007
	(-0.377)	(-0.631)	(0.202)	(-0.520)	(-1.896)	(-1.501)	(-2.230)	(-1.174)	(1.705)	(0.836)	(3.440)	(0.444)	(-1.684)	(-1.686)	(-0.300)	(-1.605)	(1.344)	(1.291)	(0.568)	(1.281)
					*		**		*		***		*	*						
F-Stat	8.171	7.271	5.534	9.552	7.019	7.090	4.809	8.216	9.749	7.552	6.581	11.334	7.274	7.186	5.209	8.126	9.454	7.426	5.859	12.034
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.168	0.160	0.135	0.185	0.160	0.164	0.127	0.179	0.178	0.153	0.147	0.193	0.167	0.166	0.137	0.179	0.169	0.149	0.133	0.194
Obs.	192	168	66	126	111	102	39	72	81	66	27	54	113	108	33	80	79	60	33	46

The table presents the results of the unconditional and conditional Fama-MacBeth regressions of Equation (13a) and (14a) as well as (13b) and (14b) respectively. The unconditional regressions are performed on the full sample, ranging from July 1993 (m=60) to June 2009 (m=252), to June 2007 excluding the financial crisis (m=228) as well as two subsamples from July 1993 (m=60) to December 1998 (m=126) and January 1999 (m=127) to June 2009 (m=252) respectively. The conditional regressions are conditioned both on the general equity market, as well as on the real estate equity market. All returns are discrete, equally-weighted monthly excess returns and denominated in local currency as described in Section 8.2. Monthly individual real estate equity returns in month m+1 are matched to their factor loadings $\hat{b}_{p,m}$, $\hat{s}_{p,m}$ and $\hat{h}_{p,m}$ that are derived from the first-stage five-year rolling time-series regression of 16 real estate equity portfolio returns on $rm - rf$, SMB, and HML as illustrated in EQ (12a) and (12b). $\hat{g}^1_{p,m}$, $\hat{g}^2_{p,m}$, $\hat{v}^1_{p,m}$, $\hat{v}^2_{p,m}$ are the

coskewness measure as described in Section 5. Cross-sectional regressions of individual real estate equity returns on the factor loadings and coskewness are performed each month. The reported slope coefficients, F-statistics and adjusted R-squared are the mean values across all cross-sections. T-values are based on Fama-MacBeth (1973) standard errors corrected for serial correlation. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).

Table 13: Cross-Section Regression Results - Robustness Check Using Value-Weighted Returns

	Panel I: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + e_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.008	0.014	0.005	0.009	0.035	0.036	0.024	0.041	-0.030	-0.021	-0.031	-0.030	0.042	0.041	0.037	0.045	-0.036	-0.027	-0.026	-0.043
λ_b	(1.126)	(2.446)	(0.825)	(0.899)	(7.143)	(7.714)	(5.425)	(5.811)	(-4.714)	(-3.989)	(-6.221)	(-3.284)	(10.845)	(10.277)	(11.896)	(7.987)	(-6.459)	(-5.864)	(-7.340)	(-4.854)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	0.002	0.003	-0.001	0.003	-0.001	0.001	-0.005	0.001	0.006	0.005	0.006	0.006	-0.007	-0.005	-0.012	-0.004	0.013	0.014	0.010	0.014
λ_s	(0.545)	(0.742)	(-0.261)	(0.718)	(-0.274)	(0.323)	(-1.146)	(0.281)	(1.842)	(1.493)	(1.244)	(1.394)	(-1.840)	(-1.321)	(-2.886)	(-0.848)	(3.372)	(3.166)	(2.287)	(2.653)
									*				*		***		***	***	**	**
	-0.002	-0.002	-0.002	-0.002	0.000	-0.001	0.003	-0.002	-0.005	-0.003	-0.011	-0.003	0.007	0.006	0.003	0.009	-0.014	-0.014	-0.007	-0.019
λ_h	(-0.706)	(-0.529)	(-0.449)	(-0.548)	(0.024)	(-0.281)	(0.721)	(-0.420)	(-1.876)	(-0.975)	(-2.940)	(-0.736)	(2.396)	(2.042)	(0.649)	(2.311)	(-5.357)	(-4.754)	(-1.644)	(-5.854)
									*		***		**	**		**	***	***		***
F-Stat	10.454	9.473	7.662	11.916	8.997	8.985	6.131	10.757	12.537	10.286	10.524	13.365	9.906	9.956	7.392	11.012	11.158	8.727	7.932	13.246
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.173	0.167	0.147	0.186	0.162	0.164	0.126	0.184	0.188	0.171	0.187	0.188	0.182	0.184	0.156	0.193	0.161	0.139	0.139	0.176
Obs.	192	168	66	126	113	105	43	70	79	63	23	56	108	102	33	75	84	66	33	51

Table 13 (cont'd): Cross-Section Regression Results - Robustness Check Using Value-Weighted Returns

	Panel II: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{g^j,m+1}\hat{g}^j_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.009	0.016	0.003	0.013	0.036	0.036	0.020	0.045	-0.028	-0.019	-0.030	-0.028	0.042	0.041	0.034	0.045	-0.033	-0.023	-0.028	-0.035
λ_b	(1.365)	(2.622)	(0.444)	(1.271)	(7.110)	(7.672)	(3.943)	(6.433)	(-4.596)	(-3.677)	(-6.075)	(-3.156)	(10.985)	(10.671)	(8.957)	(8.600)	(-5.220)	(-4.076)	(-7.510)	(-3.480)
		***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	0.001	0.002	0.000	0.001	-0.001	0.001	-0.003	0.000	0.003	0.004	0.005	0.003	-0.007	-0.004	-0.011	-0.004	0.010	0.012	0.011	0.010
λ_s	(0.228)	(0.570)	(-0.019)	(0.257)	(-0.297)	(0.267)	(-0.628)	(-0.014)	(1.049)	(1.115)	(0.952)	(0.682)	(-1.897)	(-1.300)	(-2.818)	(-0.946)	(2.432)	(2.436)	(2.303)	(1.570)
													*		***		**	**	**	
	-0.003	-0.003	-0.001	-0.004	-0.001	-0.002	0.005	-0.005	-0.006	-0.003	-0.011	-0.003	0.006	0.006	0.004	0.008	-0.015	-0.015	-0.005	-0.021
λ_h	(-0.856)	(-0.681)	(-0.107)	(-0.914)	(-0.311)	(-0.585)	(1.152)	(-1.010)	(-1.895)	(-0.943)	(-2.739)	(-0.850)	(1.837)	(1.502)	(0.749)	(1.633)	(-4.838)	(-4.250)	(-1.131)	(-5.364)
									*		**		*				***	***		***
	0.000	0.000	0.000	-0.001	-0.001	-0.001	0.000	-0.001	0.000	0.001	0.001	0.000	-0.001	-0.001	-0.001	-0.001	0.000	0.001	0.001	0.000
λ_{g^j}	(-0.884)	(-0.589)	(0.245)	(-1.004)	(-1.450)	(-1.444)	(-0.602)	(-1.351)	(-0.112)	(1.127)	(1.381)	(-0.556)	(-1.827)	(-1.495)	(-2.246)	(-1.335)	(0.457)	(1.165)	(2.419)	(-0.431)
													*		**				**	
F-Stat	8.162	7.419	5.976	9.308	7.063	7.051	4.808	8.449	9.734	8.032	8.159	10.381	7.798	7.800	5.771	8.690	8.630	6.830	6.180	10.216
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.174	0.168	0.146	0.189	0.163	0.165	0.125	0.187	0.190	0.173	0.187	0.192	0.184	0.186	0.155	0.197	0.161	0.140	0.137	0.177
Obs.	192	168	66	126	113	105	43	70	79	63	23	56	108	102	33	75	84	66	33	51

Table 13 (cont'd): Cross-Section Regression Results - Robustness Check Using Value-Weighted Returns

	Panel III: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{g^2,m+1}\hat{g}^2_{p,m} + e_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
	0.010	0.016	0.004	0.013	0.036	0.037	0.022	0.045	-0.028	-0.020	-0.029	-0.027	0.042	0.041	0.036	0.044	-0.032	-0.023	-0.028	-0.034
λ_b	(1.426)	(2.593)	(0.667)	(1.254)	(7.362)	(7.940)	(4.418)	(6.453)	(-4.419)	(-3.811)	(-5.533)	(-3.059)	(10.745)	(10.167)	(9.450)	(8.173)	(-5.089)	(-4.144)	(-6.839)	(-3.372)
		**			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
	0.001	0.003	0.000	0.002	0.000	0.001	-0.003	0.001	0.004	0.006	0.004	0.003	-0.005	-0.003	-0.012	-0.002	0.010	0.012	0.011	0.009
λ_s	(0.369)	(0.759)	(-0.102)	(0.449)	(-0.099)	(0.304)	(-0.688)	(0.279)	(0.933)	(1.376)	(0.772)	(0.660)	(-1.559)	(-0.905)	(-2.878)	(-0.499)	(2.192)	(2.243)	(2.161)	(1.365)
															***		**	**	**	
	-0.002	-0.002	-0.001	-0.003	-0.001	-0.002	0.005	-0.004	-0.005	-0.002	-0.012	-0.002	0.007	0.006	0.003	0.008	-0.014	-0.014	-0.005	-0.020
λ_h	(-0.702)	(-0.520)	(-0.203)	(-0.687)	(-0.204)	(-0.442)	(1.017)	(-0.830)	(-1.529)	(-0.672)	(-2.784)	(-0.487)	(1.938)	(1.597)	(0.658)	(1.785)	(-4.916)	(-4.261)	(-1.230)	(-5.512)
											**		*			*	***	***		***
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000
λ_{g^2}	(-0.127)	(0.135)	(0.416)	(-0.267)	(-0.536)	(-0.473)	(0.179)	(-0.628)	(0.429)	(1.181)	(0.574)	(0.228)	(-0.452)	(-0.472)	(-1.220)	(-0.137)	(0.316)	(1.051)	(1.773)	(-0.426)
																			*	
F-Stat	8.205	7.463	6.062	9.328	7.125	7.116	4.941	8.467	9.751	8.041	8.157	10.405	7.867	7.882	5.920	8.724	8.640	6.815	6.203	10.217
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.175	0.169	0.149	0.189	0.165	0.167	0.129	0.187	0.190	0.173	0.187	0.191	0.187	0.189	0.160	0.198	0.161	0.139	0.138	0.176
Obs.	192	168	66	126	113	105	43	70	79	63	23	56	108	102	33	75	84	66	33	51

Table 13 (cont'd): Cross-Section Regression Results - Robustness Check Using Value-Weighted Returns

	Panel IV: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{\hat{v}_{m+1}}\hat{v}_{p,m} + e_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.009	0.015	0.005	0.011	0.035	0.036	0.022	0.042	-0.028	-0.020	-0.029	-0.027	0.041	0.040	0.036	0.043	-0.032	-0.024	-0.027	-0.035
	(1.314)	(2.463)	(0.734)	(1.113)	(7.233)	(7.781)	(4.589)	(6.152)	(-4.363)	(-3.800)	(-5.481)	(-3.027)	(10.473)	(9.925)	(9.957)	(7.802)	(-5.288)	(-4.421)	(-6.772)	(-3.612)
		**			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	0.002	0.003	-0.001	0.003	0.000	0.001	-0.003	0.002	0.004	0.006	0.003	0.004	-0.005	-0.002	-0.011	-0.002	0.010	0.012	0.010	0.009
	(0.449)	(0.893)	(-0.165)	(0.557)	(-0.032)	(0.421)	(-0.685)	(0.353)	(0.994)	(1.465)	(0.676)	(0.779)	(-1.415)	(-0.774)	(-2.786)	(-0.388)	(2.219)	(2.392)	(2.012)	(1.483)
															**		**	**	*	
λ_h	-0.002	-0.002	-0.002	-0.003	0.000	-0.001	0.004	-0.002	-0.006	-0.003	-0.013	-0.003	0.008	0.007	0.004	0.010	-0.016	-0.016	-0.007	-0.022
	(-0.729)	(-0.463)	(-0.365)	(-0.627)	(0.007)	(-0.298)	(0.881)	(-0.560)	(-1.896)	(-0.776)	(-3.350)	(-0.758)	(2.357)	(2.038)	(0.692)	(2.242)	(-5.214)	(-4.560)	(-1.625)	(-5.570)
									*		***		**	**		**	***	***		***
$\lambda_{\hat{v}}$	0.000	0.001	0.003	-0.001	-0.002	-0.003	-0.005	-0.001	0.004	0.009	0.017	-0.001	-0.001	-0.002	-0.009	0.002	0.002	0.006	0.014	-0.006
	(0.082)	(0.376)	(0.494)	(-0.178)	(-0.623)	(-0.874)	(-0.711)	(-0.205)	(0.862)	(2.540)	(2.969)	(-0.154)	(-0.314)	(-0.446)	(-1.369)	(0.480)	(0.540)	(1.691)	(2.703)	(-0.952)
										**	***							*	**	
F-Stat	8.141	7.386	5.987	9.269	7.032	7.016	4.819	8.392	9.727	8.004	8.170	10.366	7.762	7.775	5.777	8.636	8.628	6.787	6.197	10.201
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.173	0.167	0.147	0.188	0.163	0.165	0.126	0.185	0.189	0.172	0.186	0.190	0.184	0.186	0.156	0.196	0.160	0.138	0.137	0.176
Obs.	192	168	66	126	113	105	43	70	79	63	23	56	108	102	33	75	84	66	33	51

Table 13 (cont'd): Cross-Section Regression Results - Robustness Check Using Value-Weighted Returns

	Panel V: $r_{i,m+1} - rf_{m+1} = \lambda_{b,m+1}\hat{b}_{p,m} + \lambda_{s,m+1}\hat{s}_{p,m} + \lambda_{h,m+1}\hat{h}_{p,m} + \lambda_{\gamma^2_{m+1}}\hat{\gamma}^2_{p,m} + \varepsilon_{i,m+1}$																			
	Unconditional				General Equity Market								Real Estate Equity Market							
					Up				Down				Up				Down			
Sample	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II	Full	Ex FC	Sub I	Sub II
λ_b	0.010	0.016	0.004	0.013	0.036	0.037	0.022	0.045	-0.028	-0.020	-0.029	-0.027	0.042	0.041	0.036	0.044	-0.032	-0.023	-0.028	-0.034
	(1.426)	(2.593)	(0.667)	(1.254)	(7.362)	(7.940)	(4.418)	(6.453)	(-4.419)	(-3.811)	(-5.533)	(-3.059)	(10.745)	(10.167)	(9.450)	(8.173)	(-5.089)	(-4.144)	(-6.839)	(-3.372)
		**			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
λ_s	0.002	0.003	0.000	0.003	0.000	0.001	-0.003	0.002	0.004	0.006	0.004	0.004	-0.005	-0.002	-0.011	-0.002	0.010	0.012	0.011	0.009
	(0.423)	(0.838)	(-0.112)	(0.507)	(-0.017)	(0.386)	(-0.640)	(0.332)	(0.959)	(1.441)	(0.733)	(0.717)	(-1.373)	(-0.736)	(-2.756)	(-0.378)	(2.175)	(2.310)	(2.103)	(1.390)
															***		**	**	**	
λ_h	-0.003	-0.002	-0.001	-0.004	-0.001	-0.003	0.005	-0.005	-0.005	-0.002	-0.013	-0.002	0.007	0.006	0.004	0.008	-0.016	-0.016	-0.007	-0.022
	(-0.839)	(-0.605)	(-0.265)	(-0.803)	(-0.375)	(-0.650)	(0.937)	(-0.986)	(-1.531)	(-0.494)	(-3.342)	(-0.493)	(1.817)	(1.511)	(0.745)	(1.607)	(-4.965)	(-4.316)	(-1.580)	(-5.192)
											***		*				***	***		***
λ_{γ^2}	0.002	0.003	0.003	0.001	0.000	-0.001	-0.002	0.001	0.005	0.010	0.011	0.002	0.001	0.001	-0.007	0.005	0.002	0.007	0.013	-0.004
	(0.322)	(0.555)	(0.470)	(0.162)	(-0.038)	(-0.211)	(-0.315)	(0.106)	(0.790)	(1.950)	(1.909)	(0.215)	(0.211)	(0.101)	(-1.073)	(0.614)	(0.462)	(1.213)	(2.290)	(-0.535)
										*	*								**	
F-Stat	8.205	7.463	6.062	9.328	7.125	7.116	4.941	8.467	9.751	8.041	8.157	10.405	7.867	7.882	5.920	8.724	8.640	6.815	6.203	10.217
(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adj. R^2	0.175	0.169	0.149	0.189	0.165	0.167	0.129	0.187	0.190	0.173	0.187	0.191	0.187	0.189	0.160	0.198	0.161	0.139	0.138	0.176
Obs.	192	168	66	126	113	105	43	70	79	63	23	56	108	102	33	75	84	66	33	51

The table presents the results of the unconditional and conditional Fama-MacBeth regressions of Equation (13a) and (14a) as well as (13b) and (14b) respectively. The unconditional regressions are performed on the full sample, ranging from July 1993 (m=60) to June 2009 (m=252), to June 2007 excluding the financial crisis (m=228) as well as two subsamples from July 1993 (m=60) to December 1998 (m=126) and January 1999 (m=127) to June 2009 (m=252) respectively. The conditional regressions are conditioned both on the general equity market, as well as on the real estate equity market. All returns are discrete, value-weighted monthly excess returns as described in Section 8.3. and denominated in Euro. Monthly individual real estate equity returns in month m+1 are matched to their factor loadings $\hat{b}_{p,m}$, $\hat{s}_{p,m}$ and $\hat{h}_{p,m}$ that are derived from the first-stage five-year rolling time-series regression of 16 real estate equity portfolio returns on $rm - rf$, SMB, and HML as illustrated in EQ (12a) and (12b). $\hat{\gamma}^1_{p,m}$, $\hat{\gamma}^2_{p,m}$, $\hat{\gamma}_{p,m}$, $\hat{\gamma}^2_{p,m}$ are the coskewness

measure as described in Section 5. Cross-sectional regressions of individual real estate equity returns on the factor loadings and coskewness are performed each month. The reported slope coefficients, F-statistics and adjusted R-squared are the mean values across all cross-sections. T-values are based on Fama-MacBeth (1973) standard errors corrected for serial correlation. Asterisks indicate significance at the 10 (*), 5 (**) and 1% level (***).